Amendments to the Claims

1. (Cancelled)

2. (Currently Amended) A system for controlling a plurality of load devices, comprising:

a high-side system operative to source current relative to at least two associated outputs;

a low-side system operative to sink current relative to a plurality of associated inputs; and

a control system that controls the high-side system and the low-side system according to a multiplexing scheme that is operative to provide current to selected load devices of the plurality of load devices connected between the associated outputs and the associated inputs, ~~The system of claim 1,~~ wherein the high-side system further comprises at least two switch devices, the control system implements the multiplexing scheme to operate the at least two switch devices of the high-side system in a sequence for providing substantially regulated average current to the selected load devices during each cycle.

3. (Original) The system of claim 2, wherein the control system implements the multiplexing scheme based on a number of the switch devices of the high-side system being operated each cycle.

4. (Original) The system of claim 2, wherein the low-side system further comprises a plurality of low-side switch devices, the control system operates selected low-side switch devices of the low-side system commensurate with corresponding operation of a given one of the switch devices of the high-side switching system for each of a plurality of activation phases in each cycle to control the substantially regulated average current being sinked at each of the associated inputs for the selected low-side switch devices.

5. (Original) The system of claim 2, wherein the control system operates selected low-side switch devices of the low-side system using at least one of a variable pulse width and a variable current control for controlling operation of the selected low-side switch devices to sink a substantially regulated average current relative to the inputs associated with the selected low-side switch devices during each cycle.

6. (Currently amended) The system of claim [[1,]] 2, wherein

~~the high-side system further comprises at least two high-side switch devices; and~~

the low-side system further comprises a plurality of low-side switch devices, the control system controlling the duty cycle and sequence for operating the high-side switch devices and the low-side switch devices according to the multiplexing scheme to provide substantially regulated average current to each of the plurality of loads during each cycle.

7. (Original) The system of claim 6, wherein the duty cycle is functionally related to the number of the high-side switch devices being operated by the control system each cycle.

8. (Original) The system of claim 6, wherein the high-side switch devices comprise M switch devices, where M is a positive integer greater than or equal to two denoting the number of high-side switch devices, and the low-side switch devices comprises N switch devices, where N is a is a positive integer greater than or equal to one denoting the number of low-side switch devices, and where N is different from M.

9. (Original) The system of claim 8, wherein M*N defines a maximum number of the plurality of load devices capable of being independently driven by the system.

10. (Currently Amended) The system of claim [[1,]] 2, further comprising a fault monitoring system operative to detect a protection condition associated with at least one of the low-side system, the high-side system and at least some of the plurality of load devices.

11. (Original) The system of claim 10, further comprising a protection for implementing protection of at least one of the high-side system, the low-side system and the plurality of load devices in response to the fault monitoring system detecting a protection condition.

12. (Currently Amended) An integrated circuit comprising the system of claim [[1.]] 2.

13. (Currently Amended) ~~The system of claim 1~~ A system for controlling a plurality of load devices, comprising:

a high-side system operative to source current relative to at least two associated outputs;

a low-side system operative to sink current relative to a plurality of associated inputs, a control system that controls the high-side system and the low-side system according to a multiplexing scheme that is operative to provide current to selected load devices of the plurality of load devices connected between the associated outputs and the associated inputs, in combination with a load that comprises the plurality of load devices coupled between the associated outputs and the associated inputs, wherein:

the high-side system further comprises a plurality of high-side switch devices; and

the low-side system further comprises a plurality of low-side switch devices;

the external load comprising a plurality of light emitting diodes (LED's) arranged in at least two sets of LED's, each of the at least two sets of LED's being coupled to one of the associated outputs to be driven by a respective one of the plurality of high-side switch devices, the LED's in each of the at least two sets of LED's being coupled for sinking current by an associated one of a plurality of low-side switch devices of the low-side system; and

the control system controlling the high-side switch devices and the low-side switch devices according to the multiplexing scheme to provide substantially regulated average current for selectively operating the plurality of LED's.

14. (Original) The combination of claim 13, wherein the control system controls a duty cycle and sequence of the high-side and low-side switch devices to selectively operate the plurality of LED's at a switching frequency that is less than about 500 Hz.

15. (Original) The combination of claim 13, further comprising a current limiting resistance coupled between each of the low-side switch devices and the LED's in at least some of the at least two sets of diodes.

16. (Original) The combination of claim 13, wherein each of the high-side switch devices and the low-side switch devices comprises at least one transistor.

17. (Original) A light emitting diode system, comprising:

a driver system comprising:

a set of high-side switch devices;

a set of low-side switch devices;

a control system that controls operation of selected switch devices in the set of high-side switch devices and the set of low-side switch devices each cycle according to a multiplexing scheme; and

a plurality of light emitting diodes (LED's) arranged in at least two sets of LED's, each of at least two of the high-side switch devices being coupled to drive LED's in an associated one of the at least two sets of the LED's, the low-side switch devices being coupled to sink current from the LED's in each of the at least two sets of LED's, a selected subset of at least some of the LED's being selectively operated for illumination at a switching frequency based on operation of the selected switch devices by the control system.

18. (Original) The system of claim 17, further comprising a current limiting resistance coupled between each of the low-side switch devices and corresponding LED's in at least some of the at least two sets of LED's.

19. (Original) The system of claim 17, wherein the control system controls the high-side switch devices and the low-side switch devices to selectively operate the selected subset of the LED's at a switching frequency that is less than about 500 Hz, such that substantially regulated average current is provided to the selected subset of the LED's during each cycle.

20. (Currently Amended) The system of claim 17, wherein the multiplexing scheme varies based on a number of the high-side switch devices being operated by the control system during each cycle.

21. (Original) The system of claim 17, wherein the control system controls selected low-side switch devices during each of a plurality of activation phases in each cycle relative to corresponding operation of a given one of the high-side switch devices to substantially regulate an average current through the LED's.

22. (Original) The system of claim 21, wherein the control system operates the selected low-side switch devices with a variable pulse width and blanking interval during each of a plurality of activation phases of each cycle to substantially regulate the average current through the LED's each cycle.

23. (Original) The system of claim 21, wherein each of the high-side switch devices and each of the low-side switch devices comprises at least one transistor, the control system being operative to provide a bias control signal to at least one selected low-side transistors for substantially regulating the average current through the at least one selected low-side transistors.

24. (Currently Amended) The system of claim 17, wherein the high-side switch devices comprise M switch devices, where M is a positive integer greater than or equal to two denoting the number of high-side switch devices, and the set of low-side switch devices comprises N switch devices, where N [[is a]] is a positive integer greater than or equal to one denoting the number of low-side switch devices, and where N is greater than M.

25. (Original) The system of claim 24, wherein the sum of M and N (M+N) is less than the number LED's and M*N defines a maximum number of the LED's in the system.

26. (Original) The system of claim 17, further comprising a fault detection system operative to detect a protection condition associated with at least some of LED's.

27. (Original The system of claim 26, wherein the control system is operative to implement protection relative to at least one of the high-side switch devices, the low-side switch devices and the LED's in response to the fault detection system detecting a protection condition.

28. (Original) A system for driving a plurality of light emitting diodes (LED's), comprising:

means for sourcing current to at least some of the plurality of LED's;

means for controlling the means for sourcing current according to a duty cycle;

means for sinking current from an associated one of the plurality of LED's; and

means for controlling the means for sinking current relative to operation of the means for sourcing current for operating a selected subset of at least some of the plurality of LED's at a corresponding switching frequency that provides a substantially regulated average current through the LED's of the selected subset of LED's each cycle, whereby a desired intensity of illumination for the LED's of the selected subset of LED's is provided.

29. (Original) The system of claim 28, further comprising means for detecting a fault condition associated with at least a portion of the system.

30. (Original) The system of claim 29, further comprising means for implementing protection of at least some components of the system in response to detecting the fault condition.

31. (Original) The system of claim 28, further comprising means for providing a blanking time interval to delay operating the means for sinking current relative to operation of the means for sourcing current during each activation phase of each cycle.

32. (Original) The system of claim 28, further comprising resistive means for limiting current through the LED's each cycle.

33. (Original) The system of claim 28, further comprising means for programming operating parameters of the system.